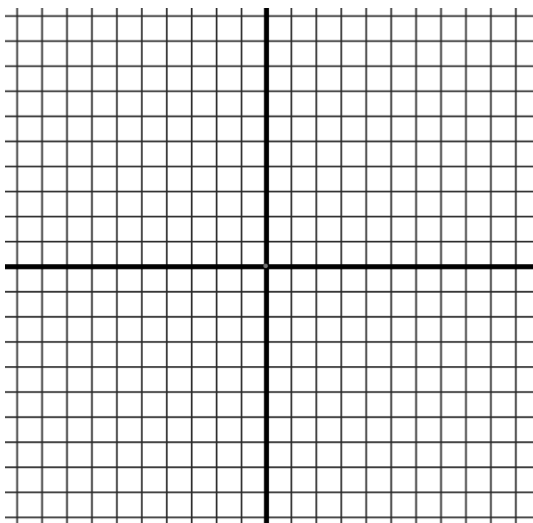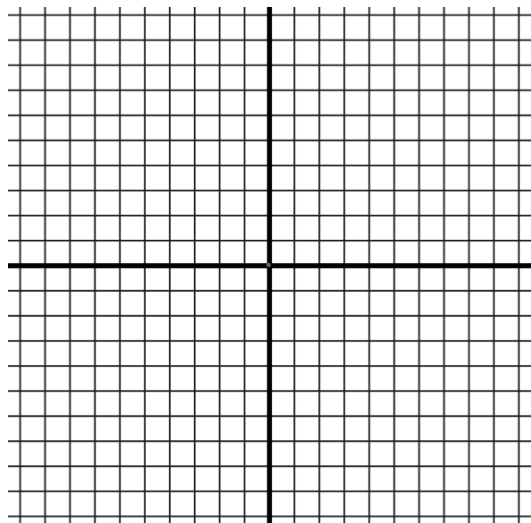**Review Questions for Unit 5 – Systems**

Solve by using graphing.

1. $y = x + 4$
    $y = -\dfrac{3}{2}x + 9$ _____

2. $y = -3x$
    $y = -4x + 2$ _____

Solve using substitution.

3. $3x + y = 6$
    $y = x - 2$ _____

4. $x = 3 + 3y$
    $2x + 9y = 11$ _____

Solve using Elimination

5. $\begin{aligned} x+5y &= 8 \\ x+3y &= 2 \end{aligned}$ _____

6. $\begin{aligned} 2x+5y &= 13 \\ 4x-3y &= -13 \end{aligned}$ _____

Solve using whichever method seems best to you. Identify your method of choice. (If you choose to use graphing, help yourself to grid paper and attach it your review packet.)

7. $\begin{aligned} y &= 2x+4 \\ y &= -x-5 \end{aligned}$ _____

8. $\begin{aligned} 3x+5y &= -16 \\ 3x-2y &= -2 \end{aligned}$ _____

9. $\begin{aligned} 9x-3y &= 5 \\ y &= 1-x \end{aligned}$ _____

10. $\begin{aligned} 3x-2y &= 0 \\ 4x+4y &= 5 \end{aligned}$ _____

11. $\begin{aligned} x-y &= 8 \\ x+y &= 10 \end{aligned}$ _____

12. $\begin{aligned} 3x+y &= 5 \\ y &= 10-2x \end{aligned}$ _____

13. Find two numbers whose sum is 52 and whose difference is 8.

14. Brenda's school is selling tickets to a spring musical. On the first day of ticket sales the school sold 3 senior citizen tickets and 9 child tickets for a total of $75. The school took in $67 on the second day by selling 8 senior citizen tickets and 5 child tickets. What is the price each of one senior citizen ticket and one child ticket?

15. The senior classes at High School A and High School B planned separate trips to New York City. The senior class at High School A rented and filled 1 van and 6 buses with 372 students. High School B rented and filled 4 vans and 12 buses with 780 students. Each van and each bus carried the same number of students. How many students can a van carry? How many students can a bus carry?

16. You want to join a gym. There is a $100 start-up fee for Planet Fitness, and then it is $10 a month. At the Fitness Edge, you need to put $50 down, and then pay $15 a month. If you just want to work out for this summer (3 months) which gym should you join? After how many months will the gym costs be equal?

Multiple-Choice --- Select the answer that best answers the question.

17. Ricardo has two types of assignments for his class. The number of mini assignments, m, he has is 1 fewer than twice the number of long assignments, L, he has.

    If he has 46 assignments in total, which of the following systems of equations can be used to correctly solve for m and L?

    a. $\begin{array}{l} m = 2L - 1 \\ m + L = 46 \end{array}$

    b. $\begin{array}{l} m = 2L - 1 \\ m = L + 46 \end{array}$

    c. $\begin{array}{l} L = 2m - 1 \\ m + L = 46 \end{array}$

    d. $\begin{array}{l} L = 2m - 1 \\ m = L + 46 \end{array}$

Review Questions for Unit 6 – Exponential

<u>Simplify</u>

18. $(x^{15}y^6)(x^7y)$

19. $(9g^5)^2$

20. $(5c^3t^2)(-6ct^{-2})(c^{-5}t)$

21. $\dfrac{42x^{15}}{-6x^2}$

22. $\dfrac{12a^{12}b^7}{24a^5b^4}$

23. $\dfrac{x^{15}y^{13}z^2}{xy^4z^2}$

24. $\left(-10x^{11}y^{15}z\right)^2$

25. $(a^7)(a^{11}b^3c)^4$

26. $\left(\dfrac{40xyz}{2a^4b^3xdewf}\right)^0$

Simplify

27. $x^{-12}y^{-15}$

28. $\left(x^{-14}y^{10}\right)\left(x^{-8}y^{-12}\right)$

29. $\dfrac{21a^4b^{-5}c^7}{7a^2b^4c^9}$

30. $(4y^7y^8)^3$

31. $\dfrac{60xyz^7}{-10x^2y^6z^{10}}$

32. $\left(\dfrac{a^6b^5}{ab^5}\right)^2$

Simplify. Leave answers in simplest radical form.

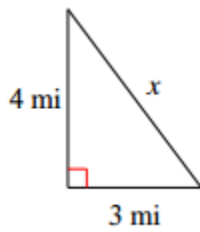33. $\sqrt{16}$

34. $\sqrt{25x^2}$

35. $\pm\sqrt{100}$
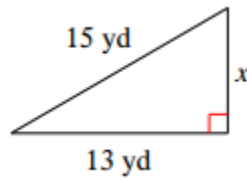
36. $\sqrt{9a^8}$

37. $\sqrt{90xy^5}$

38. $\sqrt{75x^3y^4}$

5

Find the missing side length. Answers should be in simplest radical form, when necessary.
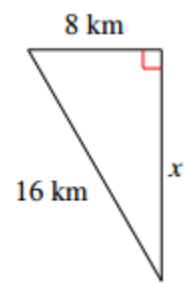
39.

4 mi
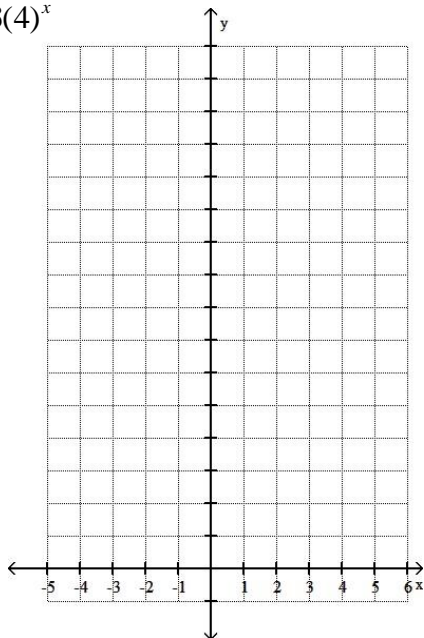
x

3 mi
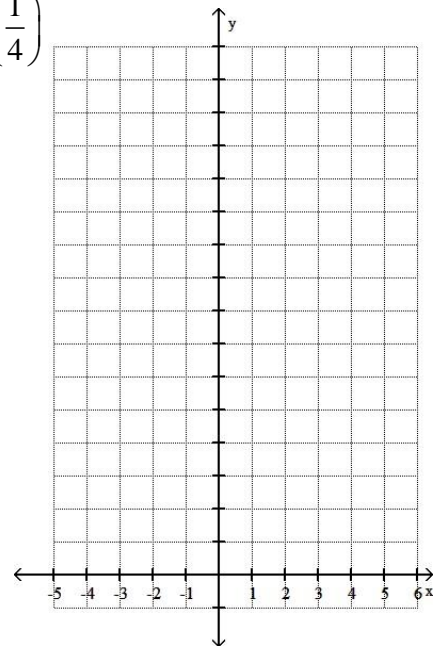
40.

15 yd

x

13 yd

42.

8 km

16 km

x

43. At the top of a tree there is a bird. The height of the tree is 20 feet. There is a bike laying on the ground away from the tree. The distance from the bird to the bike is 25 feet. Find the distance from the base of the tree to the bike on the ground. Hint: Draw a picture.

44. Sketch the graph the following exponential functions:

a. $y = 3(4)^x$

b. $y = 6\left(\dfrac{1}{4}\right)^x$

45. Identify if the table is linear, exponential function, or neither.
Explain your reasoning.
If it is linear or exponential, write the equation.

a.

x	y
0	20
3	13
6	6
9	−1

b.

x	y
0	0
2	2
4	6
6	12

c.

x	y
0	40
1	20
2	10
3	5

Each table of values represents an exponential function of the form $f(x) = ab^x$. Find the values of the parameters a and b and explain your reasoning.

46.

x	y
0	100
1	50
2	25
3	12.50
4	6.25

a = _____ b = _____

Explanation:

Each table of values represents an exponential function of the form $f(x) = ab^x$. Find the values of the parameters a and b and explain your reasoning.

47.

x	y
0	2
1	10
2	50
3	250
4	1250

$a =$ _____ $b =$ _____

Explanation:

Use for #'s 48-51: The mice population after t years can be modeled with the function
$$f(t) = 100(4)^t.$$
48. What is the growth factor?

49. What is the initial value of the population of mice?

50. How many mice will there be after 7 years?

51. In the year 1990, the population of Dreamville started with 6,500 residents. The population is increasing by 11% **each year**. The growth factor is 1.11.
   a. Write an equation that models the growth of Dreamville's population.

   b. Fill in the table. Round the population to the nearest whole number.

Year	Years since 1990	Population
1990	0	6,500
1991		
1992		
1993		

   c. Is this growth linear or exponential? Explain.

52. A business discovered that their kitchen has been infested with fruit flies! The owner keeps a record of the number of flies and finds they are growing exponentially, doubling every week. He collected the data below.
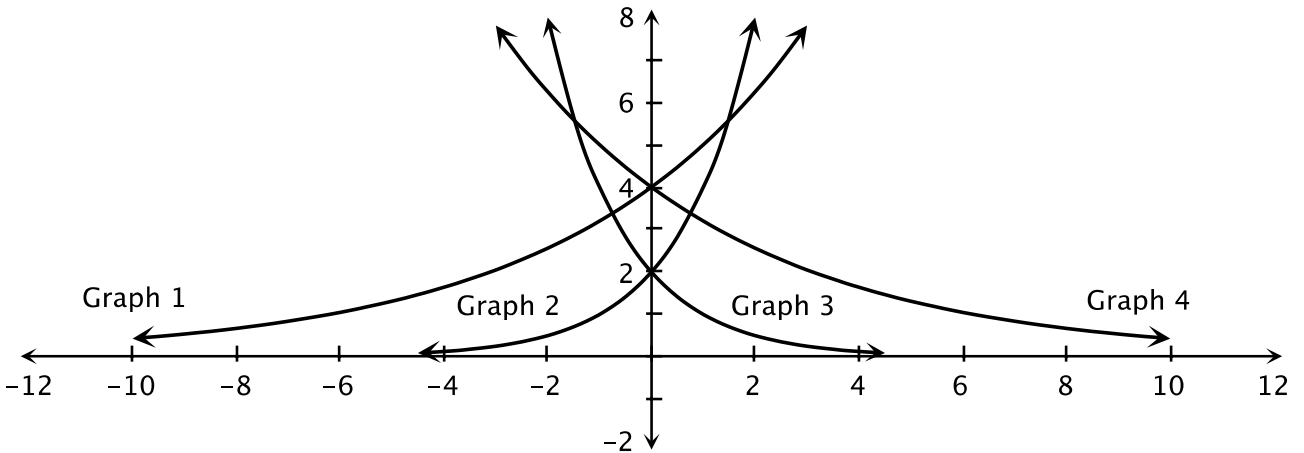   Growth factor is 2.

Number of weeks since flies were discovered	Number of fruit flies in the kitchen
0	10
1	20
2	40
3	80

a. How many flies will there be in 6 weeks?

b. How many flies will there be in 7.5 weeks?

53. Rajeev has $175 that he earned from his summer job. He puts the money in an account that yields 4% interest compounded annually, so the growth factor is 1.04. Assume that Rajeev does not make any other deposits or withdrawals from his account. After how many years, from the time he deposited the money, will Rajeev have at least $200 in his account? Grid in your answer.

54. Identifying Graphs

In the graph above, each curve represents a function of the form $y = a \cdot b^x$.

Parameter *a* represents the function's (circle one)   growth factor   or   initial value.

Parameter *b* represents the function's (circle one)   growth factor   or   initial value.

The parameter *a* is one of these values: 2   or   4.

The parameter *b* is one of these values: 0.5,   0.8,   1.25,   or   2.

For each graph, identify the values of *a* and *b*:

Graph #1   *a* = _____   *b* = _____

Graph #2   *a* = _____   *b* = _____

Graph #3   *a* = _____   *b* = _____

Graph #4   *a* = _____   *b* = _____

Review Questions for Unit 7 – Polynomials & Quadratics

Multiple-Choice --- Select the answer that best answers the question.

55. What is the sum of $3b(b-4)$ and $6(b-8)$?

    a. $3b(1-2b-16)$ b. $3b(b-2-16)$

    c. $3(b^2-2b-16)$ d. $3(b^2-2-16b)$

Add or Subtract:

56. $\left(19x^2+12x+12\right)+\left(7x^2+10x+13\right)$ 57. $\left(4x^2-6x+7\right)+\left(-19x^2-15x-18\right)$

58. $\left(20x^2+15x+13\right)-\left(-19x^2+17x+5\right)$ 59. $\left(9x^2+12\right)+\left(7x^2+10x+13\right)$

60. $(17x^2+7x-14)-(-6x^2-5x-18)$ 61. $(-18x^2+4x-16)-(15x^2+4x-13)$

Multiply:

62. $4(x+2)$

63. $-3(2x^2+1)$

64. $6(x^2+2x+7)$

65. $4x(1-x)$

66. $-x^2(x+5)$

67. $3x^2(4x^3-5x+10)$

68. $(a-5)(a-3)$

69. $(5x-1)(6x+4)$

70. $(2y-1)(5+y)$

71. $(2a-3)^2$

72. $(x+4)^2$

73. $(x+2y)(x+5y)$

Factor:

74. $34a - 17$

75. $8a^2 - 4a$

76. $3x^3 y + 9xy^2 + 36xy$

77. $x^2 - 8x + 15$

78. $x^2 + 12x + 35$

79. $x^2 + 5x - 24$

80. $x^2 - 24x + 144$

81. $x^2 - 7x - 30$

82. $3x^2 + 12x + 9$

83. $5x^2 + 40x - 100$

Solve by using the zero product property:

84. $(x+8)(x-8)=0$

85. $(x-5)(x-11)=0$

86. $(2x-5)(3x+7)=0$

87. $3x(4x-9)=0$

Solve by factoring:

88. $x^2+3x-40=0$

89. $3x^2-18x-48=0$

Solve by using the quadratic formula:

Quadratic Formula

Solutions to the equation $ax^2+bx+c=0$ are given by the formula: $x=\frac{-b\pm\sqrt{b^2-4ac}}{2a}$.

90. $x^2+3x+2=0$

91. $4x^2-8x-1=0$

Review Questions for Unit 8 - Statistics

92. The following data represents the number of text messages sent in one day by a group of students:

$$3, \; 5, \; 7, \; 12, \; 13, \; 14, \; 21, \; 23, \; 23, \; 23, \; 23, \; 29, \; 39, \; 40, \; 56$$

a. To the nearest tenth what is the mean number of text messages sent by the students?

b. What is the mode number of text messages sent by the students?

c. What is the median number of text messages sent by the students?

d. What is the range in the number of text messages sent by the students?

e. What is the interquartile range (IQR) for the number of text messages sent by the students?

f. Which number text messages appears to be an outlier?

g. If the outlier is eliminated which statistic will change more, the mean or median? Explain.

93. Box & Whisker is not drawn to scale.

9   15   17   21   25
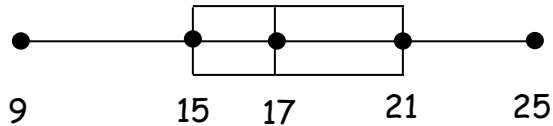
What is the median? _____
What is the smallest number? ____
What is the range? _____
What is Q_3? ____
What is the inter-quartile range? ____

94. The following table shows the speeds of different ocean animals.

Marine Animals	Speed (mph)
Albacore, leaping	40
Killer Whale	35
Shortfin Mako	31
Blue Whale	30
Barracuda	27
Fin Whale	25
California Sea Lion	25
Common Dolphin	24
Leatherback Turtle	22
Mahi Mahi	20
Gentoo Penguin	17
Bottlenose Dolphin	17
Mackerel	12
Pacific Salmon	8
Sea Trout	5

a) Find the mean, mode, and range.

Mean = _____

Mode = _____

Range = _____

b) Find the five number summary and the IQR.

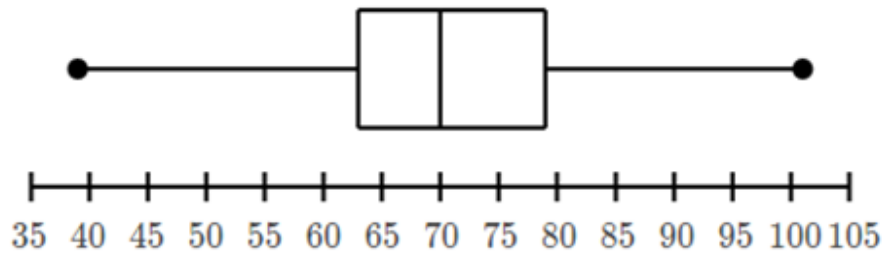|	min	Q_1	med	Q_3	max
Speed(mph)					

IQR = _____

c) Draw a box and whisker plot below. Label the minimum, Q_1, median, Q_3, and the maximum.

16

95.

Resting heart rates (beats per minute)

35 40 45 50 55 60 65 70 75 80 85 90 95 100 105

The box plot above summarizes the resting heart rates, in beats per minute, of the members at a gym. What is the range of resting heart rates?

Grid in your answer.